

## **Influence of hydrophobe content on the solution rheology of hydrophobically modified terpolymer of SO<sub>2</sub>, N,N-diallyl-N-carboethoxymethylammonium chloride.**

Hussein, Ibnelwaleed A.; Mozumder, M. Sayem; Abu Sharkh, Basel F.; Ali, Sk. Asrof; Al-Naizy, Raafat.

Department of Chemical Engineering, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia.

European Polymer Journal (2005), 41(10), 2472-2482.

### **Abstract**

Rheol. properties of hydrophobically modified copolymer of SO<sub>2</sub>, N,N-diallyl-N-carboethoxymethylammonium chloride and the hydrophobic monomer N,N-diallyl-N-octadecylammonium chloride were studied. The influence of hydrophobe content (HP) and polymer concn. was studied. Polymers with HP content in the range 1.5-5% were examd. and the concn. was varied in the range 2-5 wt%. Both dynamic and steady-shear expts. were performed in ARES rheometer. Copolymers were obsd. to exhibit typical viscoelastic behavior even with low HP content. Both the dynamic viscosity,  $\eta'$  and storage modulus,  $G'$ , increase with the increase of both the polymer concn. and the HP content of the system. The viscosity of the high HP content polymer showed a strong shear dependency, while  $G'$  was a weak function of frequency and gel-like behavior was obsd. The zero-shear viscosity,  $\eta_0$ , showed a strong concn. dependency ( $\eta_0 \propto \alpha$ ;  $1.1 < \alpha < 5.9$ ). The concn. dependency of  $\eta_0$  suggests that intermol. assocn. is dominant in the high HP content polymer. Control of the HP content and polymer concn. of this class of polymers can lead to a wide range of interesting rheol. properties.